

REPORT
CD NO.

COUNTRY USSR

DATE OF INFORMATION 1953

SUBJECT Economic; Technological - Machine tools, tools,
upsetting automatics

DATE DIST. 8 Dec 1953

HOW PUBLISHED Monthly periodicals, daily newspaper

WHERE
PUBLISHED Moscow

NO. OF PAGES 4

DATE
PUBLISHED Jun - Jul 1953

SUPPLEMENT TO
REPORT NO.

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SPECIAL HIGH-PRODUCTION METALWORKING EQUIPMENT IN THE USSR

STRESS NEED FOR SPECIALIZATION IN SOVIET INDUSTRY -- Moscow, Voprosy Ekonomiki,
Jul 53

At many enterprises of various branches of industry, the normal tool is produced in small batches and by outdated methods so that its cost is high. Strict specialization in production and mass output of normal tools at plants of the tool industry would improve the quality and lower the manufacturing costs of these items.

The following data shows how much more expensive it is to produce a normal tool at a nonspecializing plant than at plants of the former Ministry of Machine Tool Building.

<u>Type of Tool</u>	<u>Cost of Producing at Nonspecializing Machine Building Plant (rubles)</u>	<u>Price List of Former Ministry of Machine Tool Building (rubles)</u>
Hand taps, 6 x 1 mm	9.80	1.05
Chasers, 6 x 1 mm	9.60	1.15
Hand reamers, 10 mm	7.80	2.35
Drills, 3 mm	2.80	0.65
High-speed steel drills, 4.1 mm	2.10	1.05

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Thus far, specialization in the USSR tool industry has made it possible to organize constant-flow production with the use of conveyers not only in assembling but also in machining micrometers and calipers at the Moscow Kalibr Plant, chasers and taps at the Moscow Frezer and Sestroretsk plants, and segments for circular saws at the Kirzhach Plant.

With further specialization, the production of metalware can be converted from metal-cutting machine tools to upsetting automatics. This change would increase labor productivity and decrease the consumption of metal per unit. In using four-spindle automatic lathes at many plants, 600 bolts or 1,500 nuts can be machined per shift, whereas in using upsetting automatics, the output of bolts can be increased to 18,000 and of nuts to 25,000 per shift.

In the manufacture of a bolt 12.7 millimeters in diameter and 45 millimeters long, a hexagonal bar weighing 155 grams is used. Of this material, 70 grams remain in the part and the other 85 grams go into chips. In the manufacture of this same bolt on a bolt-upsetting machine, only 76 grams of the starting metal are used. In other words, only 6 grams of metal are trimmed off. To manufacture a nut for this bolt on metal-cutting equipment would require 27 grams of metal, 13.5 grams of it going into chips; whereas, to manufacture it by the upsetting method, only 19 grams of metal would be required, with 5.5 grams being cut off.

The use of special high-production equipment in mass production effects a great saving because the frequent retooling in the manufacture of different parts is eliminated. According to rough data, the setting up of a single-spindle automatic, depending on the diameter of bars to be machined and the number of tools that are removed, requires from 5.4 to 7 hours of a skilled set-up man's time and costs 17-22 rubles; with a four-spindle automatic, 9-14 hours and 28-44 rubles are required.

If high-production equipment is used in specialized and mass production, the manufacture of a given quantity of parts requires less production area and fewer machine tools. The following table illustrates this point:

Type of Machine Tools	No. of Machine Tools	Floor Space (meters)
Lathes	20	250
Turret lathes	20	180
Single-spindle automatics	10	140
Multi-spindle automatics	4	60

MODELS M13 AND M15 UPSETTING AUTOMATICS -- Moscow, Vestnik Mashinostroyeniya, Jun 53

Models M13 and M15 nut-upsetting automatics, designed by the Central Bureau of Presses and Forging Machines and manufactured at the Gor'kiy Milling Machine Plant, are intended for manufacturing hex nuts 10 and 25 millimeters in diameter from calibrated round stock, steel 10.

The following table shows technical and economic indexes for three of the most widely used methods of manufacturing these nuts:

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Type of Nut and Method of Manufacture	Metal Waste per Nut		Producti- vity Per Minute- Actual (units)	Power of Electric Motor for Producing One Nut, at Speci- fied Produc- tivity (kw)	Weight of Equip- ment Used in Producing one Nut, at Speci- fied Produc- tivity (tons)
	Kg	Nut			

M16 nut manufactured

On A413 automatic	0.009	21	45	0.9	1.0
On 4-spindle automatic lathe	0.036	83	3	4	1.9
By punching	0.037	84	--	--	--

M24 nut manufactured

On A415 automatic	0.040	24	35	2	2.9
On 6-spindle automatic lathe, 1261M	0.113	74	2	7	3.5
By punching	0.165	108	--	--	--

Technical Specifications

	<u>Model A413</u>	<u>Model A415</u>
Size of nut (mm):		
Thread diameter	16	24
Height	13	27
Distance across flats	27	36
Size of blank (mm):		
Diameter	22	32
Length	18	33
Ram stroke (mm)	170	260
Number of ram strokes per minute	55-65	45-50
Electric motor:		
Power (kw)	40	70
Speed (rpm)	980	980
Floor space (mm)	3,450 x 5,240	4,460 x 6,840
Maximum height above floor (mm)	2,395	2,880
Approximate weight of automatic (tons)	45	96

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Moscow, Komsomol'skaya Pravda, 11 Jul 53

The productivity of presses and forging machines greatly surpasses that of other metalworking machine tools. For example, up to 140 bolts per minute can be produced on cold-upsetting automatics, as compared with only three or four on automatic lathes.

Model A415 unique cold-upsetting automatic can put out 60 finished nuts per minute. As compared with the conventional method of manufacturing nuts, each automatic of this type can save up to 700 tons of metal per year. -- P. Lobachev, chief designer, Central Bureau of Press and Forging Machine Building.

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